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MIC.

Consists of eight film stages, an optical system, a scanning system, and a power control system.

The optical and electronic alignment requires extreme precision and are time consuming. It usually takes several hours to properly set up the alignment for the eight film stages. The images must be aligned to each other within a few microns before super-positioning. Since such minute alignment tolerances are not possible with the sole use of visual aligning techniques, an electronic system was designed for detecting and minimizing alignment errors.

The purpose is to reduce the graininess of the film by improving the sigmal to noise ratio. The object is to improve the definition of photographic images by precisely aligning from two to eight transparencies taken from identical exposure stations, then photographing and viewing the result.

This approach is particularly suited to all light limited photography, which requires a fairly fast film with resultant grain limitations.

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In the Projection Mode, the optical system projects the images to a viewing screen for visual alignment or for final composite photography.

In the Scanning Mode, a scanning raster from a CRT is projected through the system to the film exhibits where the information on the film is scanned and converted to electronic signals for electronic correlation. Each film exhibit is a one-inch circular transparency mounted in a holder of one of the film stages. A microscope objective is mounted in the base of each film stage to serve as a collector lens during both scanning and projecting modes. A housing containing a projection lamp, a photomultiplier tube and associated optics is mounted on each one of the film stages. The film stages are mounted radially about an octagonal mirror assembly. The film, placed in stage one, is used as a master to which all other images are aligned. The projection lamps behind each film stage assembly project a beam of collimated light through the film. The resultant projected image is reflected via an assembly of eight 45 degree mirrors through and parallel to the optical axis of a lar[illegible]

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MIC

Electronic Alignment by Oscilloscope

1. Video signals from one image is algebraically summed with the inverted signal from the other image. The operator adjusts the stages for a null output.
2. A dual beam oscilloscope in which both images are presented as video outputs and the operator is thus provided with a visual display of the correlation of the two images while alignment is in progress.

2 Textronic 545A Oscilloscopes STAT

This portion of the system is inoperative. STAT reports indicate that it would require an electronics engineer that is thoroughly familiar with the system to properly operate this portion. Previous attempts at this activity to get this portion of the system operating have failed. The proposal for STAT personnel to demonstrate the system at this activity fell through.

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Where are the following:

1. Final Report
2. Operator's Manual
3. Performance Specifications
4. Input Specifications
5. Cut film for display.

Task Order #5 ?

Call [redacted] STATINTL

Task Order

1. Correlator
2. Packaging
3. Installation of Correlator at this facility
4. Demonstration of capabilities
   a. Optics
   b Electronic & Optics
5. Reports; final, Op Manual etc.
6. MIC II plans
7. Coatic Cutter

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The electronics portion of the MIC is inoperative.

Alignment can only be accomplished by visual means.

Equipment available:

1. MIC (Optical Portion).
2. Cookie Cutter
3. Photo paper and Developing Kit.

Procedure:

1. Using the cookie cutter, prepare 1" diameter sections of the area.
2. Insert one in each holder and screw it into the stage plate. Focus each with this screw arrangement.
3. Turn projector 1 on and place in flashing mode.
4. Turn projector 2 on: use swing, x, or y to make the image coincide with that from projector 1.
5. Turn 2 off and put 3 on and proceed as in previous step.
6. Do this through projector 8, then turn on all projectors to check the coincidence of the imagery.
7. Set timer and turn out all lights alone.

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7. (Continued)
a piece of photographic paper in the holder and hit start switch.
8. When timer goes off, place photo paper in developing and fixing machine.

Material needed:
1. 35 mm. 70mm or other suitable camera (tri-x)? and tripod plus several rolls of film.
2. Photos of distant objects, signs with writings, airfields, ships, bridges etc.
3. Good photographer!

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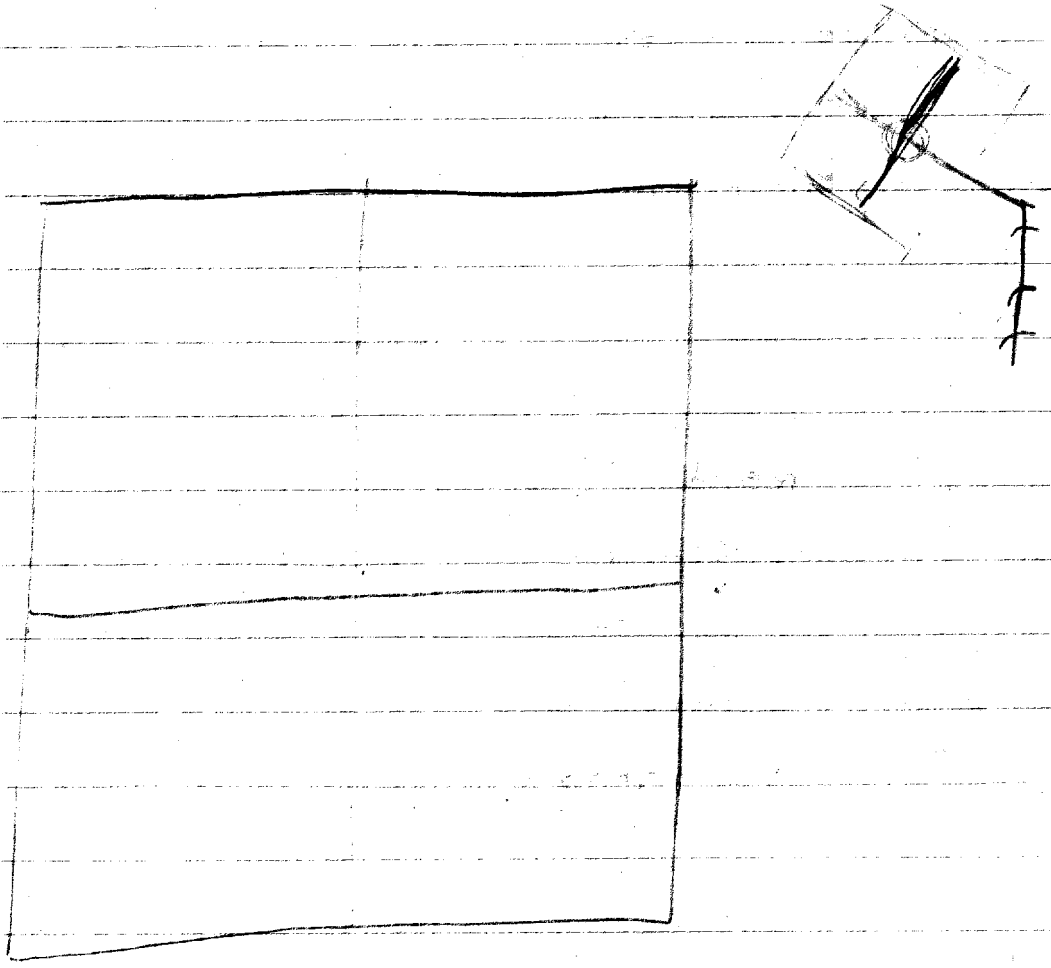

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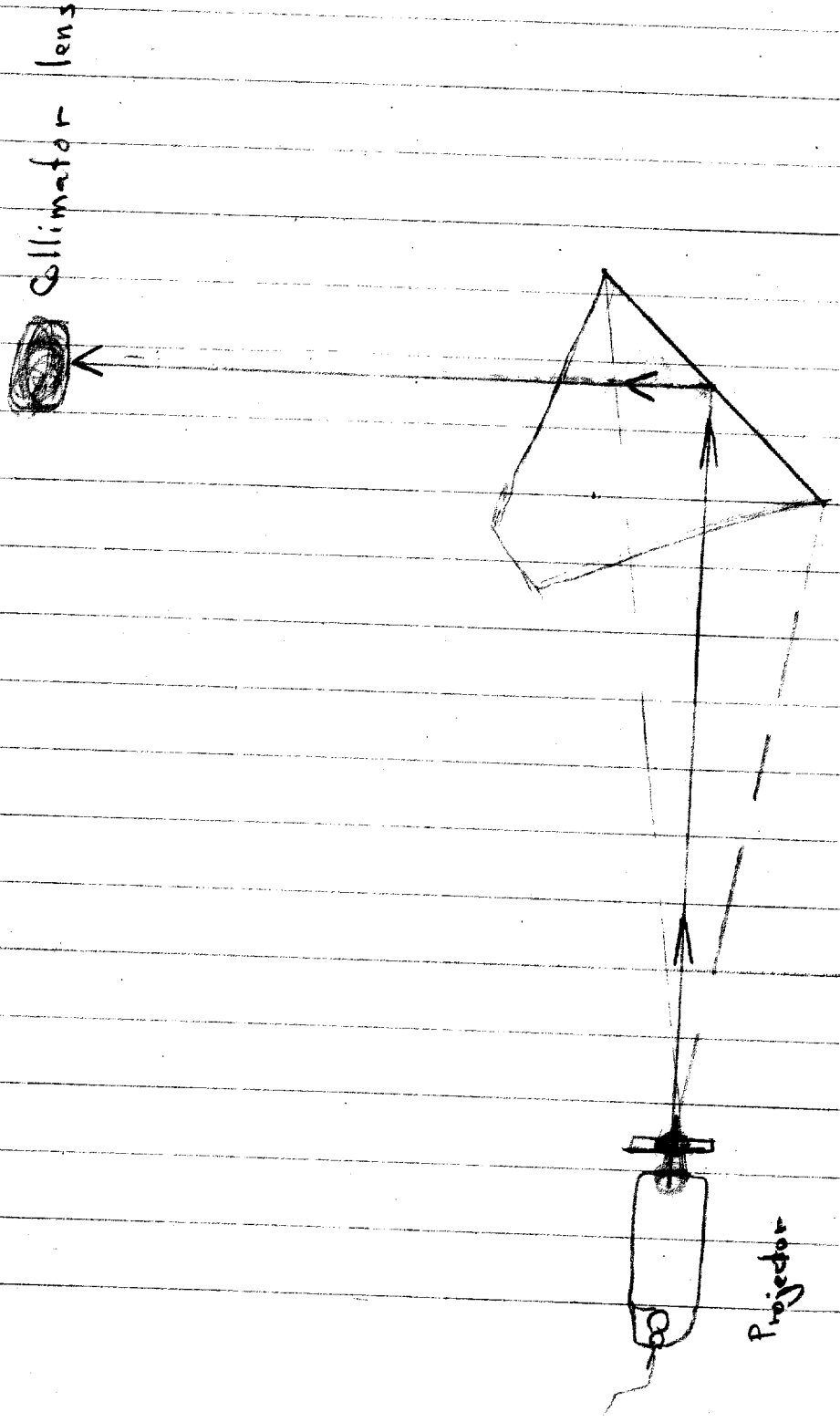

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MIC

Possible applications

Types of Photography

1. B-Mount 2nd and 3rd stations in a runaway camera mode.
2. Ground or terrestrial photography.
   Attache or collector type photography.
   a. Several rapid fire photos of distant installations.
   b. Ship or periscope photography
   c. Movies of distant objects.
3. Sections of long focal length photography taken from aircraft in a runaway camera mode.
4. [redacted] nine shot camera? (mentioned in previous reports. What is this item) STAT
5. Does Photogrammetry Inc. – Polaroid Sequential Camera have an application here?
6. Radar scope photography or other radar display application.
7. Is there an application for infrared ground or oblique photography?
8. ~~Is there a special application for TV. Continuous~~ play back or projection with a looped tape.
9. 70 mm format aerial obliques
8. Anamorphic or Aspheric lens. Is there a possibility of rectifying through this means.

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MIC

lens. The parallel light rays from each image converge at the focal point of this lens, where an 8 X 10 inch ground glass screen is placed to display the projected images. The result is that the projected images are superimposed and the image viewed on the viewing screen is a composite of all the images projected from the individual film stages. To photograph the composite image, a film pack is inserted at the viewing screen and an exposure made (or photographic paper may be used).

Disadvantages:

1. All negatives must be at the same scale
2. All must have the same (tilt, tip, and swing) (Pitch, roll, and yaw)
3. One inch format limitation.
4. Time consuming to properly align.

This system was not set up as a production type but instead to test an idea or theory.

STATINTL

Could we use [redacted] to speed up the exposure time?

STATINTL

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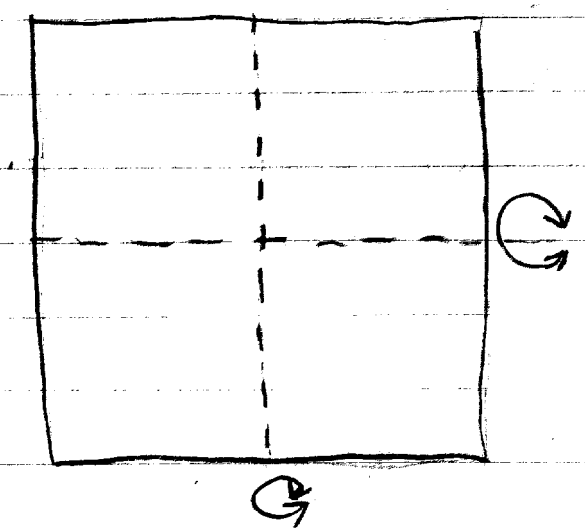

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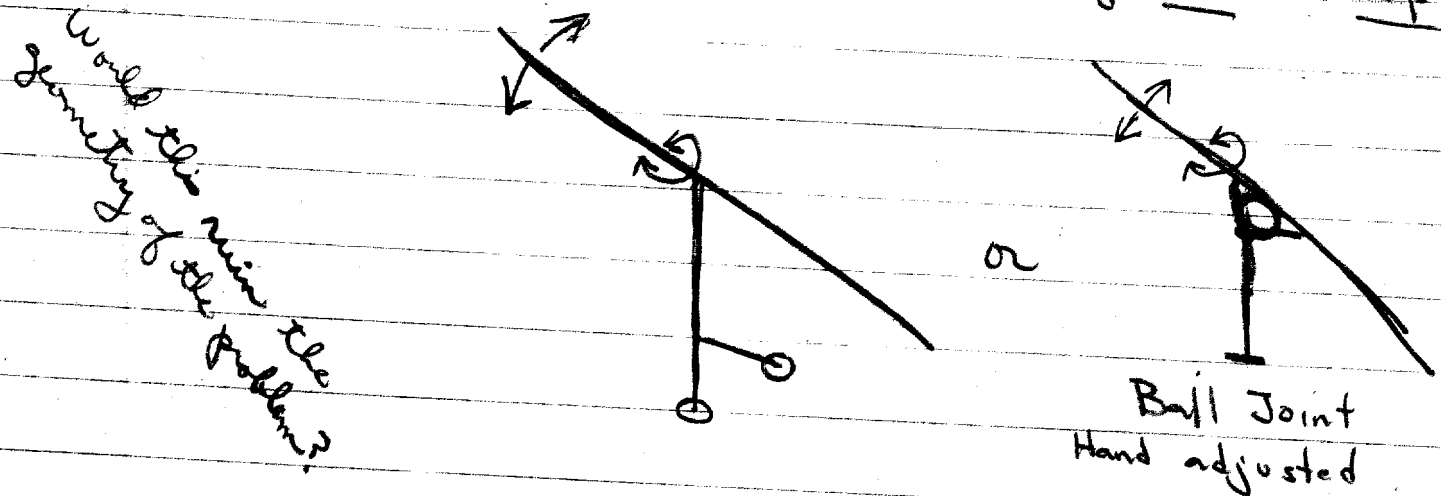
Items Needed on a Production type Model

a. Enlargement (Zoom) and reduction capability (Scale change)

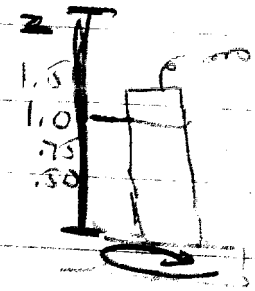
b. Each of the 8 mirrors adjustable for tilt and tip

c. Swing to be corrected in the stage plate. (or mirror assembly)

Mirror to take care of tilt and tip.



Projector



To take care of scale .5 to 2 (Possible Range)

stage plate to take care of swing

d. More rapid and easily operated final electronic alignment. Try to get time for total operation down below 30 minutes (Presently over 2 hours)

e. Possible use of Polaroid type pack as well as film pack. (For quick and dirty use)

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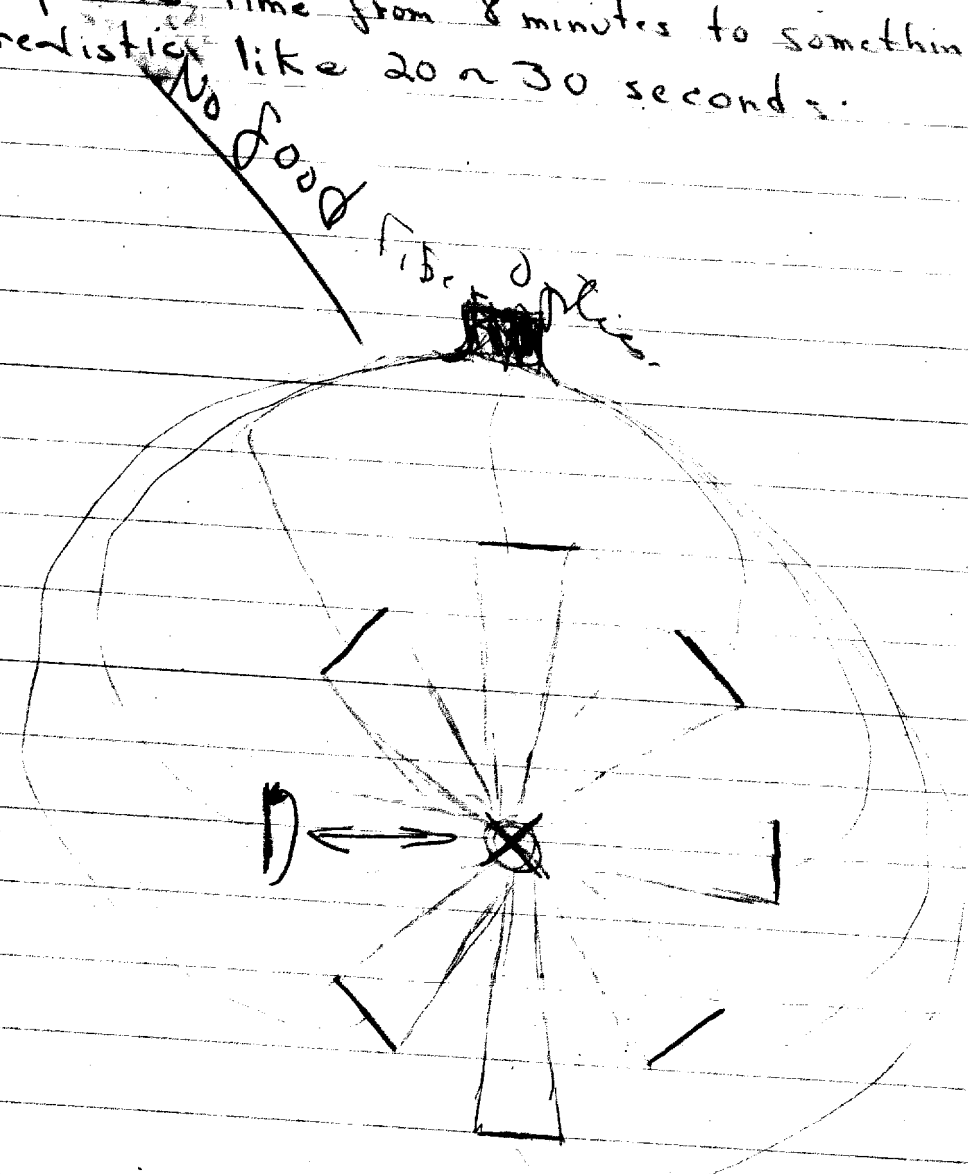
f. Possible use of diazo type film negative or positive (for quick and dirty type projection material and microscope viewing).

g. Is it possible to use fiber optics from each of the eight stages and to correlate or integrate them for presentation on a screen?

h. Need more intense light source to cut down the exposure time from 8 minutes to something more realistic like 20 ~ 30 seconds.



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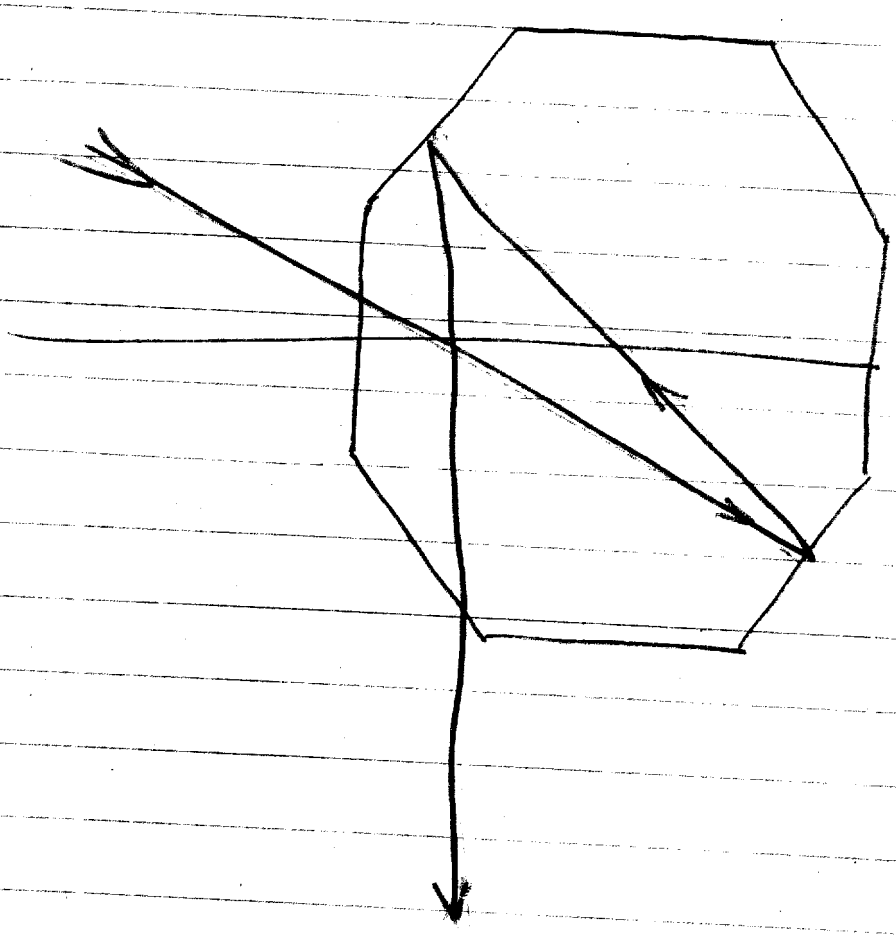
Ref:

1. Photographic Science and Engineering Journal
Vol 7, No. 4, July-August 1963
Kohler and Howell.



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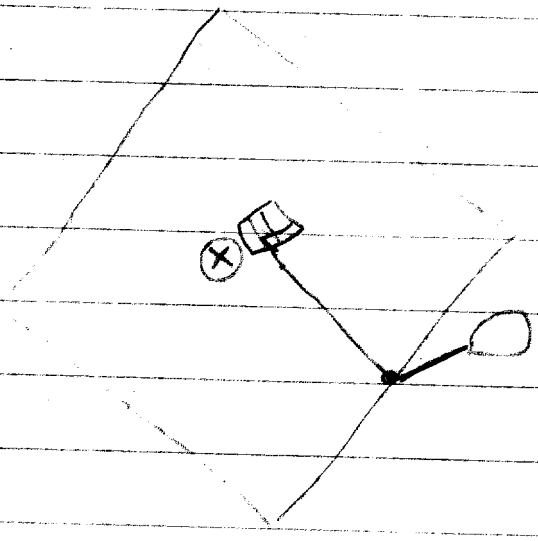
MIC

Cookie Cutter completed under Task Order #7
24 April 1964.



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(Chuck)

MEMORANDUM FOR: [illegible]

I feel that a number of features would have to be included before this could be a useful feature (zoom, higher mag, differential stretch etc. I am interested in an opinion on a letter electronic or manual registration or letter.

(DATE)

Rune's electronic microscope was

FORM NO. 101 REPLACES FORM 10-101 WHICH MAY BE USED. (47)

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MEMORANDUM FOR: Bob N.

The main trouble I can see with this proposal is that they have neglected to think of the fact that a certain amount of optical noise is introduced in the superposition process itself. If the integration is not performed with an accuracy as small as the average grain size, there will be no improvement in resolution at all. I agree that the superposition can be done visually, but I think that the full six degrees of freedom will be needed in the second channel that is to say, tilt, swing, and zoom will have to be added unless one would be content to work on very small areas of the chip.

On the whole, I think that a sequential integrator will work better than a simultaneous. 17 Dec

(DATE)

FORM NO. 1 AUG 54 101 REPLACES FORM 10-101 WHICH MAY BE USED.

(47)

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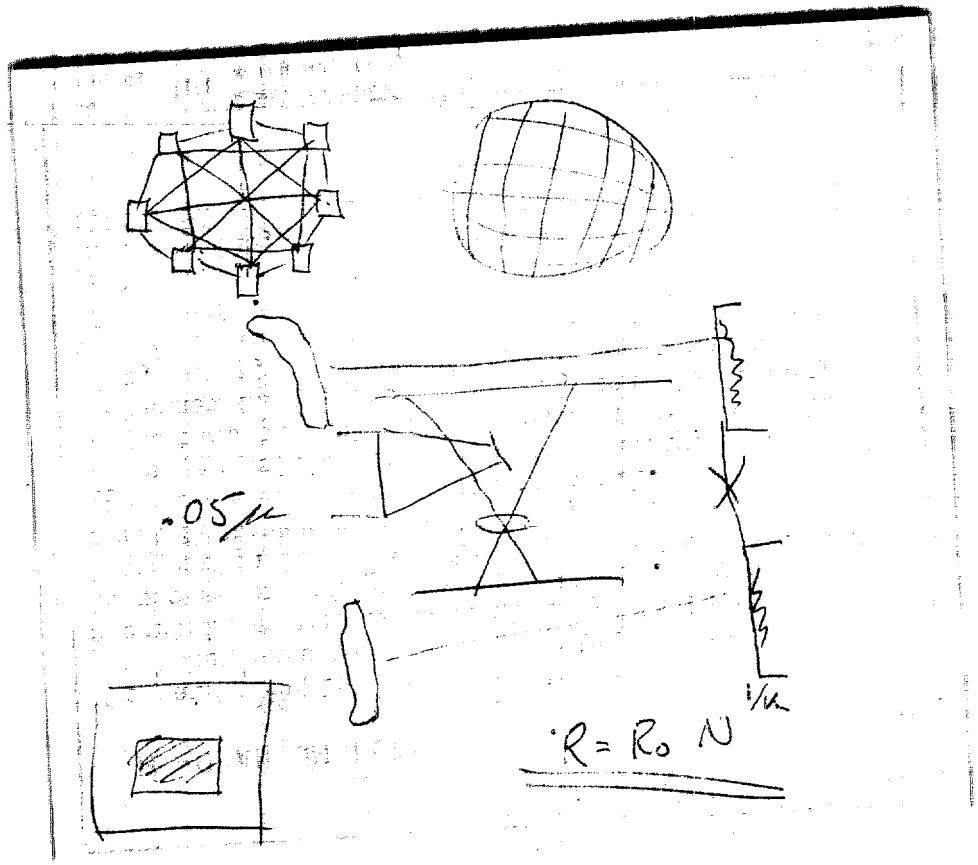

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